CLAIMS

1. A display device including a pixel electrode to which a video signal is supplied and a counter electrode to which a counter signal which becomes the reference with respect to the video signal is supplied in each pixel, wherein

a positive-side gray scale voltage and a negative-side gray scale voltage are formed with respect to the reference signal applied to the counter electrode such that

an average value of the positive-side gray scale voltage and the negative-side gray scale voltage is increased when a signal amplitude of the video signal falls in a range from a minimum value to a first value,

the average value of the positive-side gray scale voltage and the negative-side gray scale voltage is decreased when the signal amplitude of the video signal falls in a range from the first value to a second value, and

the average value of the positive-side gray scale voltage and the negative-side gray scale voltage is increased when the signal amplitude of the video signal falls in a range from the second value to a maximum value.

2. A display device according to claim 1, wherein the average value of the positive-side gray scale voltage and the negative-side gray scale voltage with respect to the signal amplitude of the video signal assumes an upper extreme point at a point where the average value changes from the increase

to the decrease and a lower extreme point at a point where the average value changes from the decrease to the increase in the range from the minimum value to the maximum value of the signal amplitude of the video signal.

3. A display device according to claim 2, wherein the average value of the positive-side gray scale voltage and the negative-side gray scale voltage with respect to the signal amplitude of the video signal which reaches the lower extreme point from the upper extreme point is changed monotonously.

4. A display device according to claim 2, wherein the average value of the positive-side gray scale voltage and the negative-side gray scale voltage is changed monotonously from the minimum value to the upper extreme point of the signal amplitude of the video signal and from the lower extreme point to the maximum value of the signal amplitude of the video signal.

5. A display device according to claim 4, wherein the average value of the positive-side gray scale voltage and the negative-side gray scale voltage of the signal amplitude of the video signal at the minimum signal amplitude of the video signal is smaller than the average value of the positive-side gray scale voltage and the negative-side gray scale voltage of the signal amplitude of the video signal at the lower extreme point.

6. A display device according to claim 4, wherein the average value of the positive-side gray scale voltage and the

negative-side gray scale voltage of the signal amplitude of the video signal at the maximum signal amplitude of the video signal is larger than the average value of the positive-side gray scale voltage and the negative-side gray scale voltage of the signal amplitude of the video signal at the upper extreme point.

7. A display device including a pixel electrode to which a video signal is supplied and a counter electrode to which a reference signal which becomes the reference with respect to the video signal is supplied in each pixel, wherein

a positive-side gray scale voltage and a negative-side gray scale voltage are formed with respect to the reference signal applied to the counter electrode such that

an average value of the positive-side gray scale voltage and the negative-side gray scale voltage is increased when a display gray scale of the video signal falls in a range from a minimum value to a first value,

the average value of the positive-side gray scale voltage and the negative-side gray scale voltage is decreased when the signal amplitude of the video signal falls in a range from the first value to a second value, and

the average value of the positive-side gray scale voltage and the negative-side gray scale voltage is increased when the display gray scale of the video signal falls in a range from the second value to a maximum value.

8. A display device according to claim 7, wherein the average value of the positive-side gray scale voltage and the negative-side gray scale voltage with respect to the signal amplitude of the video signal assumes an upper extreme point at a point where the average value changes from the increase to the decrease and a lower extreme point at a point where the average value changes from the decrease to the increase in the range from the minimum value to the maximum value of the display gray scale of the video signal.

9. A display device according to claim 8, wherein the average value of the positive-side gray scale voltage and the negative-side gray scale voltage with respect to the signal amplitude of the video signal which reaches the lower extreme point from the upper extreme point is changed monotonously.

10. A display device according to claim 9, wherein the average value of the positive-side gray scale voltage and the negative-side gray scale voltage of the signal amplitude of the video signal at the minimum display gray scale of the video signal is smaller than the average value of the positive-side gray scale voltage and the negative-side gray scale voltage of the signal amplitude of the video signal at the lower extreme point.

11. A display device according to claim 9, wherein the average value of the positive-side gray scale voltage and the negative-side gray scale voltage of the signal amplitude of

the video signal at the maximum display gray scale of the video signal is larger than the average value of the positive-side gray scale voltage and the negative-side gray scale voltage of the signal amplitude of the video signal at the upper extreme point.

12. A display device according to claim 11, wherein the display device is driven in a normally white mode in which the minimum value of the display gray scale assumes a white display and the maximum value of the display gray scale assumes a black display.

13. A display device according to claim 11, wherein the display device is driven in a normally black mode in which the minimum value of the display gray scale assumes a black display and the maximum value of the display gray scale assumes a white display.

14. A display device according to claim 1, wherein a circuit which forms the respective gray scale voltages includes gray scale division resistances and the resistances are constituted of seven or more resistances.

15. A display device according to claim 14, wherein a resultant resistance of the gray scale resistances between positive-polarity voltage outputs is set larger than a resultant resistance of the gray scale resistances between negative-polarity voltage outputs.

16. A display device according to claim 7, wherein a

circuit which forms the respective gray scale voltages includes gray scale division resistances and the resistances are constituted of seven or more resistances.

17. A display device according to claim 16, wherein a resultant resistance of the gray scale voltages between positive-polarity outputs is set larger than a resultant resistance of the gray scale voltages between negative-polarity outputs.

18. A driving method of a display device which includes a pixel electrode to which a video signal is supplied and a counter electrode to which a reference signal which becomes the reference with respect to the video signal is supplied in each pixel, wherein

a positive-side gray scale voltage and a negative-side gray scale voltage are formed with respect to the reference signal applied to the counter electrode such that

an average value of the positive-side gray scale voltage and the negative-side gray scale voltage is increased when a signal amplitude of the video signal falls in a range from a minimum value to a first value,

the average value of the positive-side gray scale voltage and the negative-side gray scale voltage is decreased when the signal amplitude of the video signal falls in a range from the first value to a second value, and

the average value of the positive-side gray scale voltage

and the negative-side gray scale voltage is increased when the signal amplitude of the video signal falls in a range from the second value to a maximum value.